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# Inverse Heat Flux Evaluation using Conjugate Gradient Methods from Infrared Imaging

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**Abstract**

Inverse heat conduction is generally associated with the estimation of unknown boundary heat fluxes on an inaccessible surface from temperature measurements performed on the accessible wall. In the present application temperature measurements using infrared thermography on 3D surfaces were performed in combination with an inverse heat conduction method. In this study the 3D transient inverse heat conduction problem was solved using conjugate gradient methods (CGM), coupled with a finite element (FE) commercial solver. The input of this model was provided by infrared thermal imaging measurements used to monitor the temperature evolution of an accessible wall. The efficiency of the method was demonstrated through numerical simulations and validated in a simplified experimental setup.

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